DOCUMENT RESUME

ED 333 189 CE 058 215

AUTHOR Allen, Kathryn; Carl, David
TITLE Model Vocational Education Distance Learning Project. Project Number: 88420032-57.
INSTITUTION Texas Univ., Austin. Extension Instruction and Materials Center.
SPONS AGENCY Texas Education Agency, Austin.
PUB DATE 30 Jun 88
NOTE 43p.; Cover title varies slightly.
PUB TYPE Reports - Descriptive (141) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Access to Education; *Allied Health Occupations Education; Computer Assisted Instruction; Curriculum Development; Delivery Systems; Demonstration Programs; *Distance Education; Electronic Mail; Feasibility Studies; *Health Services; High Schools; Models; Program Development; *Program Effectiveness; Program Evaluation; Program Implementation; *Rural Education; Rural Schools; School Districts; Telecommunications; Teleconferencing

ABSTRACT

A Texas project developed a model distance learning program for a Health Care Science course. It determined the feasibility of using a distance learning delivery system for providing small rural districts with additional vocational education options. Activities included advisory committee selection, course development and support material selection, preparation of an outline of semester topics, and preparation of evaluation instruments. Media selected for delivering instruction were print materials, audioconferencing, electronic mail, computer-assisted instruction, and videotapes. Ten female high school students at three sites participated. The delivery model was found to be effective, acceptable, and viable. Seven characteristics of an effective distance learning model cited in "Learning at a Distance" were incorporated. A number of evaluation procedures monitored progress and success: precourse evaluations; weekly reports; electronic mail and site managers audioconferencing; class assignments, tests, and student presentations; student success; postcourse evaluation and student interviews; and site manager interview. Grades earned by students on assignments and tests showed they were able to learn as effectively as if they had been in a traditional classroom. Before and after taking the course, students maintained a positive attitude about distance learning. Site managers and school administrators indicated a strong desire to continue distance learning. (Instruments and survey results are appended.) (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

TX88CD17
530/6/10/87-044
019167

ED333189

Model Vocational Education Distance Learning Program

Kathryn Allen, Ph.D.
David Carl, Ed.D.

Sponsored Cooperatively by

Texas Education Agency

and

Extension Instruction and Materials Center
Division of Continuing Education
The University of Texas at Austin

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

June 30, 1988

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Project Number: 88420032-57
RFA Number: PD02

The project reported herein was performed through a contract with the Texas Education Agency under the provisions of the Carl D. Perkins Vocational Education Act (Public Law 98-524). Contractees undertaking such projects are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Texas Education Agency position or policy.

CE058215

BEST COPY AVAILABLE

Model Vocational Education Distance Learning Project

Kathryn Allen, Ph.D.
David Carl, Ed.D.

Extension Instruction and Materials Center
Division of Continuing Education
The University of Texas at Austin

Funded by

Texas Education Agency

June 30, 1988

Project Number: 88420032-57
RFA Number: PD02

Table of Contents

	Page
Purpose	1
Goals and Objectives	1
General Project Design and Procedures	1
Methodology	1
Student Population	4
Instructional Staff	5
Results and Accomplishments	5
Characteristic 1: Standards for Teachers and Mediators	6
Characteristic 2: Consistently Train and Retrain Staff	8
Characteristic 3: Evaluate Instructional Materials Before Distribution	8
Characteristic 4: Ensure Provisions for Communications	9
Characteristic 5: Provide for Rapid Response Time and Feedback	9
Characteristic 6: Package Course Content	9
Characteristic 7: Provide Ready Access to Resources	10
Evaluation Procedures and Findings	10
Precourse Evaluations	10
Weekly Reports	11
Electronic Mail and Site Managers Audioconferencing	11
Class Assignments, Tests, and Student Presentations	11
Student Success	12
Postcourse Evaluation and Student Interviews	12
Site Manager Interview	14
Problems and Solutions	15
Financial Evaluation	17
Conclusions, Implications, and Recommendations for Future	20
Conclusions	20
Implications	21
Recommendations	22
Appendices	

Purpose

The purpose of the project, as specified by the Texas Education Agency, was to develop a model distance learning program in a selected vocational program area and determine the feasibility of utilizing a distance learning delivery system for providing students in small rural districts with additional vocational education options.

Goals and Objectives

The goals of the project were two-fold. The first was to develop a model electronic delivery system for distance learning. The second was to evaluate the feasibility of using this model to provide educational opportunities to students in rural schools.

The general objective was to develop a distance delivery system that was simple and economical to operate - a model that would be a realistic and viable instructional option for small school districts. At the same time, the delivery of instruction had to be effective and appealing to students. The specific objectives of the project included:

1. Identification of a vocational education course that could be taught by utilizing a distance learning system.

2. Development of a model vocational education distance learning program that utilizes a variety of technological advancements. These technologies included: (1) computer-assisted instruction; (2) videotape instruction; (3) interactive audioconferencing; (4) electronic mail; and (5) printed materials.

3. Determination of the feasibility of offering additional vocational courses through the model distance delivery system.

General Project Design and Procedures

Methodology

The project began with the selection of an Advisory Committee. The committee included persons with expertise in the areas of Health Occupations curricula, instructional technology, and distance learning. Representatives from the Texas Education Agency (T.E.A.) also served on the committee. The names of the committee members and project staff are listed in Appendix A.

The Advisory Committee met with the project staff on August 28, 1987. During the meeting, the purpose and objectives of the distance learning project were outlined. The committee endorsed the focus of

the program and offered suggestions for modifications that could strengthen the project. The major recommendation was that the pilot testing period be extended from a two-week instructional segment to a full semester course offering in the Health Occupations curriculum. After deliberation, the committee members and project staff agreed that the extension of the project to a full semester course fell within the T.E.A. guidelines and would provide a more rigorous approach to the development and evaluation of a model distance learning system. Based upon the Advisory Committee's recommendations and further discussion with Dr. James Keeton of the T.E.A., the Health Care Science course was selected for development.

Following the Advisory Committee meeting a number of activities were simultaneously pursued.

- Robert Patterson, Director of Vocational Programs, at the Texas Education Agency, was contacted regarding course credit. He offered assurance that if the pilot course adequately addressed the essential elements outlined by T.E.A. and if a qualified instructor could be hired to teach the course, students could receive a half-unit of credit toward graduation.

- Dr. Sara Barnett agreed to serve as the course instructor. Dr. Barnett is a certified Health Occupations teacher and had previously taught in Texas public schools.

- Administrators at twenty-seven rural school districts were contacted to elicit interest in participating in the project. Three districts indicated an interest in the project and were able to secure the necessary equipment, classroom space, and site manager to participate.

- The schools were selected on the basis of these criteria: 1) average daily attendance of the school district could not exceed 1200; 2) students would have access to a medical care facility in the community; 3) the school would provide a person to serve as site manager; 4) the school would provide adequate classroom space; and 5) a confirmation that a Health Care Science course was not currently being offered in the school district.

- Several audioconferencing bridging services were reviewed which could provide support for instruction. The audio communications service selected for the project was Darome Connection, Inc.

- The Electric Pages service, National Information System, Inc., was selected as the computer telecommunications company for electronic mail since it was already available in many schools throughout Texas.

- Work was begun on the development of the course and selection of support materials. Five types of media were selected for delivering

instruction: print materials (text books, reference books, worksheets, crossword puzzles, and word finds), audioconferencing, electronic mail, computer-assisted instruction, and videotapes. The primary textbook selected for the course was Basic Allied Health Education Core, this text had been published by the Extension Instruction and Materials Center in 1982 and had received wide acceptance in Texas schools. The text supported the goals of the course and matched the essential elements specified in Course Outline of Essential Elements for Health Care Science. The course development process continued throughout the semester. Whenever possible, existing sources of instructional resources were used rather than developing new materials. For example, videotapes and computer assisted instruction programs were rented or borrowed whenever possible.

- An outline of the semester topics was prepared. Development and refinements of the curriculum and examinations continued throughout the fall months.

- Evaluation instruments were prepared to evaluate student, instructor, and site manager experience with the use of a technologically based learning system as well as their attitudes toward such systems. A detailed description of these instruments is available in the "Evaluation" section of this report.

- Computer software for word processing and electronic mail were selected (i.e. AppleWorks and Point to Point). Simplified directions for use of the telecommunications package and the use of the Electric Pages electronic mail system were prepared.

In January, prior to the beginning of classes, site managers from each of the school districts were invited to attend an orientation workshop held in Austin. Mr. Jerry Ryan from Goliad and Ms. Leslie Bennett from Clifton were able to attend. Ms. Nan Gilbert and Ms. Edith Beck from Seymour were unable to attend due to poor weather conditions. The site managers were addressed by the course instructor Dr. Barnett, Dr. Keeton from the T.E.A., and project staff. See Appendix B for workshop agenda. The following items were discussed:

a. Goals of the project
b. Curricular scope and sequence
c. Responsibilities of site managers
d. Use of equipment (computers and audioconference convener)
e. Use of computer software
f. Support from E.I.M.C. staff

The project manager made on-site visits at each of the participating high schools. At each location, the site manager was assisted in

setting up the equipment for use during the semester. They were also shown how to use the software for electronic mail. At each school, some equipment adjustments had to be made (e.g. installation of a dedicated telephone line, selection of classroom facilities for audioconferencing, and installation of modem). Since the representatives from Seymour were unable to attend the first workshop in Austin, the personnel at this location also were given an overview of the workshop activities.

Classes were started on January 18. Audioconferencing hardware/usage difficulties were solved during the first few days of class. The course continued to be taught each week using the audioconferencing system with the instructor delivering lectures from Texarkana and the students participating from their schools. At regular intervals through the semester, students used a variety of the instructional media (e.g. computer-assisted instruction to learn first aid; videotapes to learn medical terminology; electronic mail for sending written assignments; and audioconferencing for regular class lectures).

Several types of evaluation were conducted during the semester. The evaluations included an attitude questionnaire for students and site managers, weekly progress reports from site managers, as well as written assignments, oral class presentations, quizzes, and tests from students. See the "Evaluation Procedures and Findings" section of this report for more detailed information.

Student Population

At the start of the course, nine students at three sites were involved in the distance learning project. Students were admitted to the course on the recommendation of the high school principal or counselor. Two weeks into the semester, a tenth student asked to be permitted to enroll in the class. The instructor allowed late admission with the understanding that the other students would help her review the class material that she had missed. (Notation: The classroom at Clifton was in the nurse's room. The "tenth" student was not feeling well one day and was resting in the nurse's room during the class. After seeing the class in action, she asked to be enrolled in the course.)

All ten students were female. The youngest was fifteen years old and in the 9th grade, however, the majority of the students (seven) were seventeen or eighteen years old and in the 12th grade. Before the first class session, an attitude questionnaire was administered to each student. A summary of the results of the precourse questionnaire, listing the frequency of responses from students may be found in appendix C. While six of the students had some experience using computers, few members of the group had experience with

electronic mail or audioconferencing. Although they had little experience with using technology, the students were open to the opportunity to learn via educational media. Most of the students indicated that they would prefer to learn by using technology rather than by talking to a teacher in person. In appendix D is a summary of the responses from the site managers and instructor. It is interesting to note that the adults and students had similar levels of experience with technology and interest in learning via technology. The primary attitudinal difference between these two groups was seen in their feelings toward learning directly from a teacher. The site managers and instructor all agreed that learning about a school subject from a live teacher was preferable to learning via technology; the large majority of students indicated a preference to learn through technology rather than in a face to face setting with a teacher.

Instructional Staff

The instructor for the project was Dr. Sara Barnett. Dr. Barnett was responsible for the development of the curriculum, evaluation of the students, and the delivery of the lectures through audioconferencing. The instructor worked with Ms. Sharon Montgomery, the project instructional designer, to adapt the course for presentation via distance learning strategies. Site certification, technological problems, and the development of self instructional units were handled by the project manager, Dr. David Carl. Additional staff members provided support in content and technical areas. The site managers were appointed by the administrators at the local school districts and served as the local contact persons and facilitators.

Results and Accomplishments

The development of a model for the delivery of Health Care Science was one of the goals of the project. The primary criteria for evaluating the model were that it should be effective, acceptable to the students and school administrators, and be a viable means to deliver instruction for rural schools at a reasonable cost. The model was structured to follow the guidelines specified in Guide to Distance Learning as an Alternative Delivery Procedure published by T.E.A. An assumption was made that the major elements of the model should be generalizable to the delivery of other academic and vocational courses.

The model developed during this project for the delivery of instruction was found to be effective, acceptable, and viable. The T.E.A. Guide cited the publication, Learning At A Distance: A World Perspective and Meeting Learner Needs Through Telecommunications, A Directory and Guide to Programs. This document listed seven characteristics necessary for the creation of an

effective distance learning model; these characteristics were incorporated into the development of the current model.

Characteristic 1: Standards for Teacher and Mediators

In a traditional classroom setting, one teacher customarily assumes total responsibility for the development of content, delivery of instruction, creation of teaching materials, maintenance of attendance records, reservation of clinical experiences, selection and use of ancillary teaching materials, etc. The special circumstances of teaching to students at distant sites precludes the effective use of this approach. Rather, responsibilities must be shared and coordinated to assure that high quality instruction is possible. The model used in this project took advantage of several types of professionals. The responsibilities of each of these personnel are listed below.

- Instructor and Content Specialist

The instructor was responsible for the development of the course content to meet T.E.A. specified standards, delivering lectures, the development of tests/assignments/clinical experiences, and the evaluation of students' work. The instructor was a certified Health Occupations educator with experience in teaching Health Care Science in a traditional classroom setting.

- Project Manager

The project manager was responsible for the overall management of the project and in particular dealt with elements of the project not associated with direct instruction of the students. These responsibilities included: certification of sites, coordination of the Site Managers Workshop, evaluation reports, logistical concerns, and coordination of resources. The project manager had a background in the delivery of instruction through technology, administration of instructional programs, and budgeting. The manager coordinated activities through electronic mail and telephone.

- Instructional Designer

The instructional designer worked with the instructor in translating traditional classroom instruction into a form that could be effectively delivered via distance learning techinques. Additional duties included: formatting lesson plans, obtaining copyright permissions, and coordinating the distribution of print and mediated instructional materials to schools. The instructional designer had extensive experience in the development of instruction for distance learning via video, audioconferencing, and independent study.

- Site Managers

The site managers were full time staff or faculty employees who had been selected and assigned by the school district to participate in the distance learning project as a portion of their duties. The site managers were responsible for the coordination of activities at the local level. Examples of their responsibilities included: maintenance of attendance records, arranging for students to learn to use various educational technologies, distribution of course materials, and coordination of clinical site tours. The backgrounds of the managers were varied. The professional titles of these individuals included: Assistant Principal, Counselor, Curriculum Director, and Teacher's Assistant. The essential characteristics shared by the site managers were an interest in distance learning, an ability to organize academic activities, and a capability to deal with ambiguity.

- Support Personnel

Distance learning necessarily requires a number of support staff. The assistance of three types of support personnel was frequently used. The first of these was the audioconference bridging company's telephone operators. Darome Connection, Inc. served as the bridging service and referred to their employees as "conference coordinators." This may be an apt title since the operators constantly monitored the classes to assure that the audio technical quality was optimum. Each class day the operators contacted the schools and the instructor and placed them into the audio bridging system. While the class was being conducted, the operators would constantly check the quality of the audio signal and if there was a problem with the audio at any site, it would be corrected immediately.

A second critical staff support person was the computer specialist. This individual provided advice and assistance in matters relating to computer hardware and software purchase and use. The computer specialist was available on an "as needed" basis.

A third support person was the graphic artist. The instructor sent the lesson plans and class handout to the graphic artist via electronic mail. The artist would then reformat the information and print it using laser printers. The result was professionally produced documents that were then mailed to site managers and students through the U. S. Postal Service. The development team worked to assure that all facets of communication in the project were as professional as possible; the class lesson plans and handouts were a major element in this process.

Characteristic 2: Consistently Train and Retrain Staff

Whenever technology is used as a means to deliver instruction, it is necessary to train staff and students to use the media effectively. The training for this project took several forms. The first formal instruction took place during the Site Managers Workshop which was conducted prior to the beginning of the semester. As a portion of the workshop, site managers were taught how to: provide day to day maintenance for the computers and audio conveners, perform simple trouble shooting, and prepare a classroom so that it would be conducive for student learning. The site managers were also given an opportunity to learn the basic elements in word processing, use of computer communications software, and procedures for logging on/off the electronic mail system. As an aid, new instruction sheets were prepared for the computer software programs. These instruction sheets were designed as reference guides for use of software at schools during the semester.

Follow up training was also provided. On a regular basis (at least once every three weeks) the project manager contacted the site managers on an individual basis to provide assistance in using hardware and software. During these conversations, individual questions were answered and problems solved. In addition, there were two audioconference meetings among the instructor, site managers, and project staff. During these meetings, additional instruction was provided on advanced techniques for using the educational media.

Characteristic 3: Evaluate Instructional Materials Before Distribution

All instructional materials were evaluated on two criteria - content accuracy and quality. Before the Health Care Science course was conducted, the curriculum was evaluated by T.E.A. to assure that content satisfied the essential elements as approved by the State Board of Education. In addition, all print and mediated instructional materials were reviewed by at least two content specialists and editors to assure content accuracy and grammatical/spelling correctness. The second criterion dealt with quality of materials. With the exception of crossword puzzles, word find puzzles, and similar exercises, all printed materials were produced on laser printers giving them a professional appearance. Mediated materials were borrowed, purchased, or rented from commercial firms. The course development team believed that high quality instructional materials had a direct effect on the quality of work performed by the students.

Characteristic 4: Ensure Provisions for Communications

Both the development and delivery of instruction for this course were done at a distance. The instructor prepared the curriculum and lesson plans working from her office in Texarkana; the instructional designer and other support staff worked from their Austin offices. This is a distance of 340 miles. Frequent personal meetings were not possible due to the expense and travel time required. To accommodate this method of development of instruction, the project team communicated frequently by telephone, electronic mail, and regular mail. Communications took place on almost a daily basis. The exchange of ideas continued, primarily via electronic mail, throughout the delivery of the course.

Other communications opportunities included: monthly site manager and project staff meetings; weekly written reports from site managers, telephone conversations, and, of course, the sharing of electronic mail among the instructor, site managers, project staff, and students. A hotline telephone number was also provided to all site managers and the instructor so that critical problems or suggestions could be acted upon quickly and efficiently.

Characteristic 5: Provide for Rapid Response Time and Feedback

Audioconferencing is an interactive medium. Each day the instructor set time aside for students and to ask and receive answers to questions. These conversations tended to be of a general nature and of interest to most students in the class. Electronic mail was used for personal messages. Unit examinations were administered by the site managers and mailed to the instructor. To expedite reporting grades, the instructor used electronic mail to send test scores to site managers and students. Some assignments, such as reports on clinical visitations, were completed on word processing and sent by electronic mail to the instructor for evaluation. This communication procedure kept the information lag time to a minimum.

Characteristic 6: Package Course Content

In addition to the audio presentations by the instructor, each week the students received copies of the week's lesson plan, class handouts, and assignments. Evaluation forms completed by the site managers indicated that these materials arrived in a timely fashion and assisted the students in learning and planning their study time.

Characteristic 7: Provide Ready Access to Resources

All students had access to support materials including: library holdings of reference materials, videotape programs and video players, computers and printers for electronic mail and word processing, computer-assisted instruction, audioconferencing equipment, and clinical sites for visitation. At each school there was also a site manager who was able to handle student problems.

Evaluation Procedures and Findings

Due to the experimental nature of the project, a number of evaluation procedures were used to monitor progress and success. Each of these procedures is discussed detail.

Precourse Evaluations

Prior to the start of classes, an attitude questionnaire was developed and administered to participating students, site managers, and the instructor. The questionnaire was administered to the site managers and the instructor during the Site Managers Workshop. They were then directed to administer the questionnaire to their students before the first day of classes began. The site manager at Seymour completed the form during the project manager's on-site visit. The questionnaire may be found in Appendix C.

The focus of the precourse questionnaire was to evaluate the level of experience that the students, site managers, and the instructor had with the media that were to be used to deliver instruction. Equally as important, the questionnaire evaluated the attitudes that project participants held regarding each instructional technology and their attitude toward traditional vs technologically delivered instruction. The results indicated that the experiences with technology and attitudes toward experimentation with alternative delivery systems for learning was remarkably similar between the students and site managers/instructor.

The only area of distinction between students and educators (site managers/instructor) was in their attitude toward the traditional, live teacher in the classroom setting. The students' attitude toward this form of instruction was not as favorable as that of the educators. During an informal discussion with students at a later date during the semester, this attitude seemed to persist. Many of the students indicated that they preferred that the site managers not be present in the classroom during the audioconference lectures. Students stated that the presence of a site manager was not necessary and might be distracting. This attitude may be attributed, in part, to the growing desire for autonomy displayed by high school students in general.

Information from the questionnaire was given to the instructor for use in the development of instructional units. For example, the students indicated a lack of experience in using electronic mail, so simplified instructions were written for using computers to send messages through the Electric Pages mail system. In addition, a portion of class time was planned into the schedule to allow students time to learn how to use the medium. Smaller class assignments were given to permit them to learn about electronic mail by trial and error.

Weekly Reports

Each week, the site managers filed reports that evaluated the class for the previous week. See Appendix E for the weekly evaluation form. The site managers commented on the curriculum, technology being used for the week, student or technical problems, timely delivery of materials, and other matters of concern. During the first stages of the project, the problems noted dealt with the various instructional technologies being used. Difficulty in sending electronic mail, installation of modems, and problems with telephone lines topped the list. As these difficulties were solved, the comments on the report forms tended to be a confirmation that materials were arriving through the mail and that no problems were apparent. The weekly reports provided an informal means of assessing the general attitude of students and site managers at the schools. The attitude was positive throughout the semester.

Electronic Mail and Site Managers Audioconferencing

Informal evaluations often took place. The instructor, site managers, project staff, and students exchanged electronic mail on a regular basis. The content of the communications covered a variety of topics including updating class assignments, taking quizzes, reporting grades, answering questions, and general conversation regarding the field of health care and the use of technology. There was no set schedule for these exchanges; they occurred as necessary throughout the semester.

Once a month, the instructor, site managers, and project staff would meet via audioconference. These sessions were used to make announcements of general interest to the group, discuss special problems and successes, and to deliver supplemental inservice instruction to the site managers.

Class Assignments, Tests, and Student Presentations

An important concern during the project was to deliver the same quality of educational experiences to the students via distance as they would have received in a traditional classroom setting. One form of

quality assurance was the administration of homework and examinations. Throughout the semester there was a regular, interactive dialogue between instructor and students through audioconference. Just as in the case of the traditional classroom setting, the instructor presented instruction and the students asked and answered questions. Assignments were completed by students including oral presentations directed toward the other members of the class. Unit tests were administered on a regular basis. Since the instructor was an experienced classroom teacher, the examinations and other assignments were similar to those she had used in the traditional classroom.

Student Success

The instructor, an educator with nine years teaching experience in the health occupations curriculum, indicated that the students enrolled in the distance learning course represented a fairly typical grouping of students who would have participated in a health occupations course in a traditional classroom setting. The scores earned by the students tended to be higher that those which would be normally expected in a course of this type. The instructor attributed this higher than average success, in part, to the Hawthorne effect. It is possible that using audioconferencing and the computer as an integral part of their instruction piqued the student interest in learning. When assessing the overall success of the students, the instructor believed that the distance learning method of learning was comparable with results obtainable in a traditional classroom setting.

Postcourse Evaluation and Student Interviews

During the last two weeks of class, the project manager made a second site visit to each of the participating schools. The students were asked to complete a postcourse questionnaire which reevaluated their attitudes toward the effectiveness of distance learning and their attitudes toward receiving further instruction through distance learning. See Appendix F for a summary of the student responses on the postcourse questionnaire. In addition, the students were asked open-ended questions relating to their experiences during the semester.

A series of questions was asked of the students regarding presentation methods, quality of the course, and their personal reactions to various components of the distance learning experience. The first question posed to the students dealt with the reason that they were initially interested in participating in the Health Care Science course. Although all the students shared an interest in learning about the health occupations careers, generally speaking, they agreed to participate in the distance learning course as a means to "get out" of another course or to avoid another that they felt was less

inviting. Some students believed that the course would be "easier." (Apparently this perception was dispelled by the end of the semester.) Upon completion of the course, participants agreed that more students should have the opportunity to enroll in this course purely for the sake of learning the content.

Students believed that the strongest facet of the course was the quality of the instructor (enthusiasm, knowledge, and presentation style), the use of several types of mediated instruction (video, audioconferencing, and computers), and the overall organization of the course. Students were especially pleased that each week they received a full set of lesson plans and class handouts; these materials allowed them to work at their own pace. The one unit most universally praised was the instruction on C.P.R.

The need for a variety of instructional media was stressed. When asked to identify weaknesses in the instruction, students did not agree. As an example, some students felt that the videotapes were excellent while others found the same programs boring and unproductive. All students enjoyed using computers for assignments. However, they were least pleased with the electronic mail medium. They were pleased with the opportunity to visit local hospitals as part of the class and to later discuss their experiences.

When asked to identify the lasting benefits of the distance learning experience, most students believed that the nature of the course enhanced their sense of self-confidence and maturity. Several students also developed electronic mail pen-pal friendships. Toward this end, they wanted to have a recreational "get-together" at the end of class so that they could meet one another in person. While a meeting of this type was not possible during the Health Care Science course, it may be a worthwhile option to consider for future courses.

Other suggestions for improvement included a once a month student-only audioconference, less direct supervision by the site managers, and more in-class work time for the completion of assignments which required the use of technology (e.g. word processing).

In closing, the students were asked whether other courses could be effectively taught using distance learning techniques such as those employed during the Health Care Science course. They all agreed that the methods used during for their course could be used for other courses with two stipulations. The first stipulation was that the students must be "mature, responsible, intelligent, self-disciplined, honest (no cheating), and have a decent grade average." The second stipulation was that courses that are very difficult for some students, such as grammar, may be better taught by a live teacher. There was some disagreement on the second stipulation.

Site Manager Interview

Personal interviews were also conducted with each of the site managers. The consensus was that the project was very positive and brought excellent quality educational opportunities to the students in their schools. The depth of this conviction was illustrated in that each of the three participating schools indicated a desire to participate in any future projects of this kind.

When asked to identify the type of "gains" that they had observed in their students during the semester, the site managers echoed the comments of the students. Typical comments were, "This presentation method helped students develop personal discipline," and "Students developed independence and a solid understanding of the general principles of Health Care Science."

The site managers felt that the most positive aspects of the distance learning project were the overall organization of the course, professionalism and enthusiasm of the instructor, and logistical support. Each of these aspects of the distance learning model was generalizable to other curricular subjects. The site managers also stated that any subject could be effectively taught through this system as long as the course was, "set up right." The most important factor for effective instruction was that the course be well designed and taught. The majority of the students agreed with this point of view.

Each manager was also asked to identify problems or weaknesses that they saw in the distance learning system used for the Health Care Science class. The problem most often cited dealt with student use of technology. During the first few class sessions, the students were "afraid" to use the audio convener. To help overcome this problem, the suggestion was made that each student be given more time to speak and gain proficiency with the audioconferencing equipment. Although students were allowed several opportunities to speak and use the audio convener equipment throughout the semester, the site managers and students agreed that additional time would be beneficial. A similar observation was made regarding the use of other instructional technologies. The suggestion was made that a larger amount of class time be scheduled for students to use electronic mail and word processing equipment. However, this suggestion may not be practical. The Health Occupations curriculum must address specific essential elements of instruction. If a greater amount of in-class time were set aside for students to use technology for homework assignments, other critical course content might be sacrificed. A better solution for this difficulty might be to allow students to use an open period during the school day for these activities.

The site managers were asked to identify the type of student that would be best suited to enroll in a course such as Health Care Science that would be taught through distance learning systems. The managers said that they had changed their opinions on this subject during the semester. At first, they felt that only those students who planned to enter the health field should be encouraged to participate. However, by the end of the course, the managers felt that the course provided general information that would be valuable to any student. They also believed that the distance learning course required the student to display a higher level of self discipline than might usually be seen in a traditional classroom. Using this as a guide, the following student characteristics were listed as minimum criteria for participation in a distance learning course: an academic grade point of C or better, no discipline problems, no tardiness or truancy problems, and a level of maturity that indicates an ability to learn with a minimum of direct supervision.

Problems and Solutions

No serious problems occurred during the development or execution of the project; however, there were a few difficulties that did require attention. Logistical concerns were the source of the greatest number of problems during the early stages of the project. The primary problem for schools was to arrange for a dedicated telephone line into the classroom. Since the audio convener and the electronic mail system both required a dedicated telephone line, this was a basic requirement. School administrators expressed a concern related to this requirement; however, they felt that the project offered an unusually good opportunity for students and did install the necessary telephone line. While this difficulty was resolved, it should be recognized that the installation of a telephone line into a classroom does involve additional expense for the school participating in distance education.

Another equipment problem dealt with computer telecommunications hardware. Prior to participation in the distance learning project, none of the schools had access to a computer modem needed for electronic mail communications. The lower range cost for this device is approximately $200. Two schools decided that the equipment would be useful for other applications and purchased a modem and interface card. One of these sites experienced difficulty installing the equipment; following several telephone calls between the project staff and the school, the problem was solved. The Extension Instruction and Materials Center loaned an entire computer and telecommunications system to the third school.

The most unexpected logistical problem occurred when one school was shut down by the fire marshal as unsafe for occupancy. A portion of the school building had developed structural problems and was not

habitable for several days. The difficulty was handled quickly by the school district authorities who arranged for parts of the building to be repaired and the for the use of temporary classroom buildings. The instructional challenge was to assure that the students did not lose valuable class time during the school closing. The method used to solve this dilemma was to audiotape the regular class sessions among the instructor and the other two schools. The audiotapes were then sent to the third school and students reviewed them for coverage of missed material.

Problems with using the audioconferencing equipment were minor and easily corrected during the first few days of class. The first problem was the necessity to connect a telephone to the audio convener in order to know when to turn on the conferencing equipment. A phone was connected and this problem was solved. The second problem was one of simple physical coordination. The students had to depress the transmit button the microphone, pause a moment, and then speak. During the first few days of instruction students would speak to the instructor before depressing the transmit button.

Another difficulty was related to the use of the Electric Pages electronic mail system. While the site managers had some experience with word processing and basic computer operation, the use of computer telecommunications was a new concept. To help in understanding this use of technology, a set of simplified directions was written describing the use of the telecommunications software and use of the electronic mail system. In addition, during the site managers workshop a demonstration of the electronic mail system was given. Two of the schools were able to use the system with relative ease; however, the site managers who were unable to attend the workshop did experience some difficulties. In time, these problems were corrected.

The most difficult problem to solve was the result of differing spring break schedules among the schools. Spring vacation schedules were determined by individual school districts. Each of the three schools participating in the project had set aside a different week for this holiday. To further complicate the situation, the vacation schedules encompassed a five week period. The established mode of daily instruction via audioconferencing would not meet the needs of students during this period, so another strategy was developed. Two weeks of mediated self-instructional materials were produced. During the weeks in which all three schools could not meet as a group, the instruction was directed by the site managers. Accommodation of the varying dates for spring vacation was an important component in the project, since this scheduling problem will likely occur in future distance learning courses.

Financial Evaluation

The costs associated with offering a course via the distance learning system implemented during this project may be assigned to one of three expense categories. These categories are: 1) available resources; 2) continuing expenses; and 3) initial course development. A portion of the costs are "one time only," while other expenses will continue each semester a course is offered.

Available Resources

A distance learning system requires the use of technology and will necessarily have some start-up cost associated with it. These expenses will most likely not need to be incurred each time a course is offered. The list below gives examples of the types of items that are needed to offer a course using this distance learning approach.

1. Computer, printer, modem
2. Word processing and communications software
3. Telephone line into the classroom
4. Reference books
5. Video player and television monitor
6. Travel expenses attend a site managers workshop

Many of these start up resources are currently available at the schools and are used in support of other courses. This is a positive situation that allows educators to receive the maximum benefit from the use of equipment funds. Informal discussions with high school administrators and other educators indicated that the equipment in the above list is currently available (or soon will be) in secondary schools. One characteristic of the distance learning model, developed during this project was the use of resources commonly found in schools.

Continuing Expenses

There are a number of continuing expenses associated with distance learning. Expenses in this category are required for maintenance of the instructional experience and will recur each time a course is taught. Examples of these expenses are listed below.

1. Audio bridging charges
2. Rental of audio convener
3. Textbooks and computer data disks
4. Electronic mail service charges
5. Class handout and related materials
6. Salary for site manager (part time assignment of teacher)
7. Salary for instructor and distance learning support staff

The major elements of this expense category are: audio bridging, electronic mail, and salaries. In order to discuss the per student cost for each of these items, a few assumptions must be made regarding the number of students and sites likely to participate in distance learning. A total of 10 students participated in the Health Care Science pilot project; however, in order to project the costs for offering future courses via distance learning, it will be assumed that four students at each of five sites would enroll in the course. This would be a total of 20 students for the course.

Audio bridging charges: The cost of the audio bridging service was 61 cents per minute, per site. This would include five schools and the teacher.

.61 per minute
X 6 sites

$3.66 per minute

The class periods were approximately 50 minutes in duration. The class met on the audio system four days each week. In addition, each month the site managers, instructor, and project staff meet for 40 minutes to discuss matters relating to the project. On the average, the weekly usage of the system was 210 minutes.

$3.66 per minute
X 210 minutes

$768.60 per week for five sites and the instructor

The class met on the audio bridging system 15 weeks per semester.

$768.60 cost per week
X 15 number of weeks per semester

$11,529.00 Total cost for use of the audio bridging system

This expense would be shared among the five participating schools. One fifth of $11,529.00 is $2305.80 per site. This figure would then be further divided by the number of students at each site. One fourth of $2305.80 is $576.45. The final per student cost for the audio bridging system would be $576.45. It is important to point out that this is an approximate figure and is based upon 20 students equally distributed among five schools. In practice, the actual costs would vary according to the number of students at each site. For example, a site that has half a dozen students would have the same audio conference fees as a school with only one student enrolled in a course.

The difference would be that the fees would be distributed among the six students at the first school and only one at the second school.

Electronic mail: Expenses for electronic mail services can vary significantly depending upon the quantity and length of the messages as well as the time of day the services are used. The Electric Pages were used for this project and will probably continue to be the electronic mail service for schools around the state. The Electric Pages has a "sliding scale" for billing services. A higher fee is assessed for using electronic mail during peak times than is assessed for sending messages at 2 o'clock in the morning. Experience in this project has indicated that a reasonable per student cost for electronic mail was $30.00 per semester.

Salaries: Generally speaking, schools do not need to allocate additional funds for the services of a site manager. The manager was usually a teacher or teaching assistant who was assigned to monitor the distance learning program as a portion of his/her duties.

It is necessary to budget for the services of the distance learning instructor and other support staff. A reasonable figure for these professionals is $20,000 per semester course. When divided by the number of students in the course (20), the per student cost is $1,000.

Miscellaneous: There are also a number of other expenses including the rental of the audio conferencing equipment, textbooks, computer assisted instruction programs, mailing cost, etc. These costs would be approximately $100 per student.

Summary of maintenance costs: For the model circumstances specified earlier (five sites/four students each), the maintenance cost for a distance learning course would be approximately $1706 per student. These are maintenance expenses only and do not reflect the cost associated with the initial development of the course nor the costs for the purchase of the equipment necessary to support the delivery of the instruction.

Initial Development Costs

The final category expenses is initial course development. While it is recognized that specific elements of classes are adjusted each time a course is taught, the large amount of time, expertise, and effort are devoted to the initial creation of the course. Adapting a course for delivery via distance learning techniques can be an involved process which requires the participation of several professionals. As a minimum, the following personnel are needed: instructor/content specialist, instructional designer, instructional technology specialists, and content reviewers.

It is not possible to specify a dollar amount that is needed for the development of any given instructional unit or course. A number of variables affect the process and need to be considered. Obviously the scope of the project is a major consideration. A lesser amount of funding would be required for the creation of a two week seminar than would be needed for a full year academic or vocational course. The development of a course in a traditional subject such as English may be less expensive than a course in astronomy where few instructional materials have been adapted for the high school curricula. The final product and delivery method for the materials also influence the amount of monetary resources necessary to support the creation of instruction. A handbook of chemistry laboratory exercises may be less expensive to design and produce than a series of educational video tapes or computer-assisted instruction programs which illustrate Newton's laws of motion.

Clearly the cost of development and production of programs, especially instructional materials to be delivered via distance learning, are dependent upon the complexity of the subject to be taught, the amount of materials that currently exist, and the format of the final product. Only experience and reliance upon the advice of instructors and media experts can specify the actual amount of funding necessary for the creation of any given instructional product. Since this phase of the preparation is vital, for the creation of high quality educational products, it must have adequate funding. The cost of the initial development should then be calculated into the overall cost of delivering the instruction; this will be true whether the instruction is to be offered through traditional means or distance learning methods.

Conclusions, Implications, and Recommendations for Future

Conclusions

Throughout the state of Texas are hundreds of rural towns where students are educated in small, self-contained independent school districts. The educational needs of students in these rural areas are similar to the requirements of their counterparts in urban areas; however, the tax base for education in the rural communities is more modest. An inevitable problem occurs: the community wants students to have access to the same courses offered in urban areas, but it is not practical to hire a teacher for a small number of students in specialized courses.

The information collected clearly indicated that a distance learning system which used print, audioconferencing, electronic mail, videotapes, and computer-assisted instruction was effective. The grades earned by students on assignments and tests show that they were able to learn the course content as effectively as if they had been in a traditional classroom. Equally important is the fact that before

taking the course and following completion of the semester, students maintained a strong positive attitude toward learning through a distance learning system. Students and site managers agreed that many of the benefits of the distance learning delivery system were not directly measurable. Increases in the students' sense of personal growth and preparation for life beyond school was repeatedly cited.

Educators at the schools (site managers and school administrators) were impressed with the effectiveness of the system and its potential to supplement the curricular offerings in their school districts. They indicated a strong desire to continue similar opportunities for their students to learn through distance learning methods. All indications were that the model distance delivery system that was developed for this project should be maintained and expanded. The expansion should continue in Health Occupations Education courses and should also be broadened to encompass other academic areas.

Implications

On May 10, 1986, the State Board of Education approved a mission statement that addresses the necessity for providing educational opportunities to students throughout Texas. In part, the statement of mission states, " . . . students will be provided the opportunity to develop the ability to think logically, independently, and creatively and to communicate effectively. Educating our children to be productive in a changing future necessitates an excellent educational system." The Board goes on to say that, "A system that can accomplishes this mission must be characterized by quality, equity, and accountability. Instruction must be provided at the highest levels of **quality**. Educational opportunities and resources must be distributed with **equity** for all students. The educational system must maintain **accountability** for demonstrated results and continuous improvement."

The use of a distance learning system similar to the one developed for this project satisfies the requirements specified in the mission statement. Test results as well as the qualitative evaluations of professional educators indicate that distance learning techniques can be as effective as educational experiences in traditional settings. One characteristic of mediated instruction is that of being highly visible and open to outside evaluation. This characteristic translates into a high level of accountability. Each facet of instruction is available for review - a characteristic not easily assessed in more traditional classroom settings.

Equity is another positive element that distance learning can bring to the educational scene in Texas. Students in small rural towns have the same educational needs as students in urban areas. It may not be financially practical for schools districts to employ instructors to teach

courses in the vocational studies programs or other areas such as gifted and talented programs. Often times, the decision of whether to offer expanded educational experiences to small numbers of students balances between finding money to pay a teacher or simply not offering the instruction to students. Through distance learning another option is available. Schools districts can, in effect, pool their financial resources and have courses offered via distance learning techniques. Clearly, this is one means to meet the spirit of the Board's mission statement to provide quality educational equity to all students in Texas and, further, to provide these opportunities at a reasonable cost.

Recommendations

- Since the distance learning system has proven to be effective in the delivery of the Health Care Science course, it is recommended that other courses in vocational education be offered using this approach.

- In addition to vocational education, the use of distance learning techniques should be considered as a means to deliver instruction in other academic areas identified by school districts.

- There are sources of funding available to schools for the initial purchase of equipment necessary for distance learning; it would be helpful for T.E.A. to continue and perhaps to expand its efforts to make this information readily available to principals and superintendents.

- The costs associated with delivering instruction via distance learning systems can be managed by the school systems; however, there are additional costs relating to the initial development of new courses which push the cost of delivery of instruction to a level that will be more difficult for schools to handle. It is recommended that T.E.A. continue to support the development of new courses that would be of general interest to a number of schools throughout the state.

Appendix A

Advisory Committee Members

Dr. Sara Barnett
Texarkana, TX

Dr. David Foster
Southwest Educational Development Laboratory
Austin, TX

Mr. Gary Haseloff
Educational Program Director
Educational Technology, Texas Education Agency
Austin, TX

Dr. Delayne Hudspeth
Associate Professor, Department of Curriculum & Instruction
The University of Texas at Austin

Dr. James Keeton
Program Director, Health Occupations
Texas Education Agency
Austin, TX

Mr. C.E. McCullough
President
AVTEC Corporation
Austin, TX

Project Staff

Dr. Kathryn Allen
Director, Extension Instruction & Materials Center
The University of Texas at Austin

Dr. David Carl
Associate Professor & Coordinator Instructional Resources
University of Arkansas
Fayetteville, AR

Ms. Sharon Montgomery
Director, Curriculum & Instruction for Independent Learning
Extension Instruction & Materials Center
The University of Texas at Austin

Appendix B

Distance Learning Project
in Health Occupations
Site Managers' Workshop

I. Introduction and project overview

II. Health Occupations Curriculum

A. Rationale
B. Scope and Sequence
C. On-site individualization of instruction
D. Learning materials distribution system
Example of weekly packet
E. Homework -- submission and evaluation procedures

II. Role and Responsibilities of the Site Manager

A. Administrative activities

1. Attendance
2. Updating project staff on progress (weekly reports)
3. Administering tests
4. Collecting homework, forwarding assignments to instructor, and redistributing to students

B. Organizational activities

1. Distributing worksheets and other handouts
2. Setting up classroom
3. Setting up and testing equipment
4. Assuring students' access to equipment and programs for class and homework
5. Referrals
   a. Content or equipment problems/questions
   Curricular matters: Sara Barnett (214) 838-6233
   Other questions: David Carl (512) 471-7716
   b. Discipline problems/questions

C. Teaching responsibilities

1. Show students how to use technologies (video tape players, two-way audio, computer)

2. Answer questions from students

3. Instruction of students in the use of word processing
4. Instruction of students in the use of Electric Pages

III. Completion of Attitude Questionnaire and Learning Styles Inventory

IV. Suggestions for site managers workshops

A. Site managers' background
B. How offer training
   1. Multiple day workshop
   2. Teach via two-way audio system
   3. Combination

V. Operation of Equipment

A. Use of the computer

1. Setting up hardware
2. Basic operation of computer/trouble shooting
3. Elementary maintenance
4. Use of C.A.I. software

5. Electronic mail demonstration

   a. Use of telecommunications package
   b. Logging onto Electric Pages
   c. Sending electronic mail
   d. Logging off Electric Pages

B. Use of video equipment

1. Operation of video cassette players
2. Basic maintenance/trouble shooting of equipment

C. Use of two-way audio equipment

1. Operation of two-way audio equipment
2. Basic maintenance/trouble shooting
3. Sign on procedures
4. Room layout

VI. Final Comments

A. Verify number of participating students

B. Confirm mailing addresses

C. Verify Electric Pages mail box numbers

D. Is further training on the computer necessary/desirable? If further training is needed how should it be done/when?

E. What telephone numbers will be used for the Darome two-way audio system at each school?

Appendix C

Precourse
Attitude Questionnaire

A. Name Student Responses N = 10

B. Age: 1 student 15 yrs; 1 student 16 yrs; 4 students 17 yrs; 3 students 18 yrs;

C. Gender (circle one): Male = 0 or Female = 10

D. Grade level (circle one): 1-9th, 1-10th, 0-11th, 8-12th

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a check mark in the parentheses under the label which is closest to your agreement or disagreement with the statements.

	Never	Rarely	Sometimes	Often
1. I have used a computer for learning about a school subject.	(1)	(3)	(5)	(1)
2. I have used video or television programs for learning about a school subject.	(3)	(2)	(5)	(0)
3. I have used a telephone for learning about a school subject.	(8)	(2)	(0)	(0)
4. I have used a computer connected to a another computer through telephone lines.	(10)	(0)	(0)	(0)

	Strongly Disagree	Disagree	Agree	Strongly Agree
5. I would like to learn about a school subject by using a computer.	(0)	(0)	(6)	(4)
6. I would like to learn about a school subject by viewing a video or television program.	(0)	(0)	(7)	(3)
7. I would like to learn about a school subject through a telephone conversation.	(0)	(1)	(6)	(3)

	Strongly Disagree	Disagree	Agree	Strongly Agree
8. I would like to learn about a school subject by connecting one computer to another through telephone lines.	(0)	(0)	(7)	(3)
9. I would feel comfortable if I had to use a video cassette player.	(0)	(0)	(6)	(4)
10. I would feel comfortable if I had to use a computer.	(0)	(0)	(7)	(3)
11. I would feel comfortable if I had to talk on the telephone.	(0)	(2)	(5)	(3)
12. I think that I could learn about a school subject if it were not taught by a teacher.	(0)	(1)	(7)	(2)
13. I enjoy new experiences when I am learning.	(0)	(0)	(5)	(5)
14. I could learn to use video cassette players.	(0)	(0)	(5)	(5)
15. I could learn to use computers.	(0)	(0)	(5)	(5)
16. Knowing how to use computers will help me increase my job possibilities.	(0)	(1)	(3)	(5)
17. Knowing how to use video cassette players will help me to increase my job possibilities.	(0)	(1)	(6)	(3)
18. I would prefer to learn from a real person rather than from a computer.	(0)	(8)	(2)	(1)
19. I would prefer to learn from a real person rather than from a video program.	(0)	(8)	(2)	(0)
20. I would prefer talk to a teacher in person rather than on than telephone.	(0)	(8)	(1)	(1)

Appendix D

Precourse

Attitude Questionnaire

Name Instructor and Site Managers Responses N = 4

Gender (circle one): Male = 1 Female = 3

Academic positions: Assistant Principal, Classroom Teacher, High School Counselor, Teachers Aid

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a check mark in the parentheses under the label which is closest to your agreement or disagreement with the statements.

	Never	Rarely	Sometimes	Often
1. I have used a computer for learning about a school subject.	(1)	(0)	(2)	(1)
2. I have used video or television programs for learning about a school subject.	(1)	(0)	(2)	(1)
3. I have used a telephone for learning about a school subject.	(3)	(0)	(1)	(0)
4. I have used a computer connected to a another computer through telephone lines.	(3)	(0)	(0)	(1)

	Strongly Disagree	Disagree	Agree	Strongly Agree
5. I would like to learn about a school subject by using a computer.	(0)	(1)	(0)	(3)
6. I would like to learn about a school subject by viewing a video or television program.	(0)	(1)	(1)	(2)
7. I would like to learn about a school subject through a telephone conversation.	(0)	(1)	(2)	(1)

	Strongly Disagree	Disagree	Agree	Strongly Agree
8. I would like to learn about a school subject by connecting one computer to another through telephone lines.	(0)	(1)	(0)	(3)
9. I would feel comfortable if I had to use a video cassette player.	(0)	(2)	(0)	(2)
10. I would feel comfortable if I had to use a computer.	(0)	(1)	(2)	(1)
11. I would feel comfortable if I had to talk on the telephone.	(0)	(1)	(1)	(2)
12. I think that I could learn about a school subject if it were not taught by a teacher.	(0)	(0)	(2)	(2)
13. I enjoy new experiences when I am learning.	(0)	(0)	(2)	(2)
14. I could learn to use video cassette players.	(0)	(0)	(2)	(2)
15. I could learn to use computers.	(0)	(0)	(1)	(3)
16. Knowing how to use computers will help me increase my job possibilities.	(0)	(1)	(0)	(3)
17. Knowing how to use video cassette players will help me to increase my job possibilities.	(0)	(1)	(3)	(0)
18. I would prefer to learn from a real person rather than from a computer.	(0)	(0)	(4)	(0)
19. I would prefer to learn from a real person rather than from a video program.	(0)	(0)	(4)	(0)
20. I would prefer talk to a teacher in person rather than on the telephone.	(0)	(0)	(4)	(0)

Appendix E

Periodic Progress Report
Health Occupations
Distance Learning Project

Week of : __/__/__ Site Location: _____

Name of Site Manager: _____

Lesson Name(s): _____

_____

Equipment used: _____

_____

_____

Observations:

Curriculum Materials: _____

_____

_____

_____

Equipment: _____

_____

_____

Additional Comments: _____

_____

_____

Appendix F

Post Course

Attitude Questionnaire

Name _____

Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a check mark in the parentheses under the label which is closest to your agreement or disagreement with the statements.

	Not Effective	Somewhat Effective	Effective	Very Effective
1. I believe that learning about health occupations by using a computer was ...	( )	( )	(9)	(1)
2. I believe that learning about health occupations by using video or television was ...	( )	(1)	(4)	(5)
3. I believe that learning about health occupations by using telephone (two-way audio) was ...	( )	( )	(3)	(7)
4. I believe that learning about health occupations by using electronic mail was ...	(1)	(2)	(5)	(2)
	Never	Rarely	Sometimes	Often
5. In the future, I would like to receive further instruction through computer assisted instruction.	( )	(1)	(4)	(5)
6. In the future, I would like to receive further instruction through two-way audio.	( )	( )	(3)	(7)
7. In the future, I would like to receive further instruction through electronic mail.	( )	(1)	(6)	(3)
8. In the future, I would like to receive further instruction through video or television programs.	( )	( )	(3)	(7)

	Strongly Disagree	Disagree	Agree	Strongly Agree
9. Using electronic mail to learn about health occupations is easy.	( )	(2)	(8)	( )
10. Using two-way audio to learn about health occupations is easy.	( )	(2)	(2)	(6)
11. Using computer-assisted instruction to learn about health occupations is easy.	( )	(1)	(8)	(1)
12. Using video or television programs to learn about health occupations is easy.	( )	(2)	(2)	(6)
13. If no other method were available, I would be interested in receiving instruction through computer assisted instruction.	( )	( )	(7)	(3)
14. If no other method were available, I would be interested in receiving instruction through electronic mail.	( )	(1)	(5)	(4)
15. If no other method were available, I would be interested in receiving instruction through video or television programs.	( )	(1)	(4)	(5)
16. If no other method were available, I would be interested in receiving instruction through two-way audio.	( )	( )	(2)	(8)
17. In general, I believe that learning by using technology is effective.	( )	( )	(3)	(7)
18. In general, I believe that learning by using technology is enjoyable.	( )	( )	(4)	(6)
19. In general, I would prefer to learn by using technology rather than by attending class in a regular classroom.	( )	( )	(3)	(7)